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EXAMINER	
ELMORE, STEPHEN C	

ART UNIT	PAPER NUMBER
2186	7

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/749,750	MAIYURAN ET AL.	
	Examiner	Art Unit	
	Stephen Elmore	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *August 11 and October 8, 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-19 and 21-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-19* is/are rejected.

7)☒ Claim(s) *21-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 August 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action responds to the amendment filed August 11, 2003, paper 6. The amendment canceled claims 1-6, 20, 36 and 37, and amended claims 7-19, 21, 23-25, 27, 29, 31, 34 and 35.

2. Claims 7-19 and 21-35 remain for examination.

Drawings

3. The corrected or substitute drawings were received on August 11, 2003. These drawings are **disapproved** because:

a. Figure 5 remains objected-to since it only shows features which have been described as Prior Art and therefore Figure 5 must be labeled Prior Art.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The objection to the specification is **withdrawn**, however, the specification is newly objected-to because:

a. in respect to the contents of both tables, Table 1 and Table 2, specifically in the entry for the table item labeled

	Tag	Data	State	LRU	No of Ways
Tag Write/Data Read ("TWR")	Off	On	On	Off	One

both tables 1 and 2 show that for the Tag Write and Data Read microinstruction, the Tag is turned off by the cache manager, but this condition is contradictory since it is not clear how the Tag can be written-to (i.e., Tag Write) if the Tag has been turned off.

Appropriate correction is required.

Claim Objections

5. The objection to the claims is **maintained** because:

a. claim 19 remains objected-to because the claim remains ending in a comma "," instead of a period;

b. claim 23 remains objected-to because "being disable" is non-idiomatic English;

and newly presented objections are:

c. claims 21-35 are objected-to because they contain language which is not logically clear in scope, that is,

i. in claims 21, 22, 24, 25, 26, 32, and 33, the language *"during the first microinstruction"* and *"during the second microinstruction"* is indefinite because, for example, "a second microinstruction", *per se,* is not a period of time, therefore the language "during the first microinstruction" does not specify a period of time without further identification of how the microinstruction relates to a period of time;

ii. in claims 23, 27-31, 34, 35, the language *"during the microinstruction"* has the same type problem.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 7-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to be enabled by the Applicant's disclosure, i.e., undue breadth, on the basis that these claims present a fact situation by analogy to that of a single means claim where a means recitation does not appear in combination with another recited element of means, and therefore, the claim is subject to an undue breadth rejection under 35 USC 112, first paragraph, where in,

claims 7-19, the single step is the *"(step of) disabling predetermined modules..."*;

See *In re Hyatt,* 708 F.2d 712, 714-715, 218 USPQ 195, 197 (Fed. Cir. 1983) (a single means (or by analogy a single step) which covered every conceivable means for achieving the stated purpose (or by analogy every conceivable step) was held nonenabling for the scope of the claim because the specification disclosed at most only those means (or step) known to the inventor.). When claims depend on a recited property, a fact situation comparable to Hyatt is possible, where the claim covers every conceivable structure (means or step) for achieving the stated property (result) while the specification discloses at most only those known to the inventor. In the instant application the specification discloses at most only those means (or by analogy step) for disabling the claimed predetermined module that are known to the inventor while the scope of the present claim covers every conceivable means (or by analogy step) for achieving the disabling of the predetermined module. See MPEP 2164.08(a).

8. Claim 12 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically,

a. claim 12, in the language

"in response to a tag write/data read microinstruction, data fields throughout the cache are disabled"

the disclosure fails to teach this limitation as claimed, because first, Tables 1 and 2 do not show this relationship being taught but instead show the opposite, that when a data read occurs data fields are "On" not 'Off", and second, it is not logical or possible to disable the data fields and also perform a data read.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 9, 12-14, 17, 18, and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims are indefinite because:

a. claims 12 and 13, in the language

"tag write/data read microinstruction"

it is not clear whether this language is meant to be equivalent to "tag write and data read microinstruction" or equivalent to "tag write or data read microinstruction", or equivalent to something else, that is, the interpretation of the "/" symbol can be taken to mean any of the possibilities,

i. "and";

ii. "or";

iii. "and + or";

therefore, the presence of the "/" symbol makes the scope of meaning of the claim indeterminate; however, for purposes of further claim interpretation in the remainder of the Office action the

claim language will be given the best interpretation possible, that this language is equivalent to "tag write and data read microinstruction";

b. claims 9, 14, and 19 in the language

"a tag and data read microinstruction"

and

"a tag and data write microinstruction"

it is not clear whether or not this language is meant to be equivalent to "a tag read" or "a tag write" microinstruction, therefore, without more specific tag information language, the present language makes the scope of these claims indeterminate;

c. claim 17, in the language

"in response to a tag invalidate microinstruction, tag fields and data fields throughout the cache may be disabled"

the terminology "may be" makes the scope of this claim indeterminate as to whether or not the disable activity is performed;

d. claim 18, in the language

"in response to a microinstruction, disabling predetermined modules within an internal cache, in response to a tag invalidate microinstruction, all ways are disabled except a target way"

which language is non-idiomatic English, and in view of the other amendments to the other claims, it appears that Applicant may have intended this language to read

"in response to a microinstruction, disabling predetermined modules within an internal cache, wherein (emphasis added) in response to a tag invalidate microinstruction, all ways are disabled except a target way"

however, the claim language was modified unlike the other amendments, so that, the term "wherein" appears to have been inadvertently omitted by the applicant from the original claim language, therefore, for these two reasons the present claim language of this claim is not understood;

e. claim 19, for a second reason, in the language

"wherein a victim allocation unit is to disable in response to a microinstruction"

this language is not clear in scope because it is missing an essential element, that being the element that is disabled, and since the language does not identify what is disabled, it is not clear whether or not a disabling activity is covered by the language;

f. claim 19, for a third reason, the scope of meaning of this claim cannot be determined because the claim fails to end in a period (it instead ends in a comma), suggesting that the claim is not complete, therefore it's scope is indeterminate.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claims 7-11, 13, 14, 16 and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Lyon et al., USP 6,427,188.

Lyon teaches the claimed power control method in an integrated circuit and cache control method, see Abstract and Summary, comprising:

Claim 7,

the limitations,

a. *in response to a microinstruction, disabling predetermined modules within an internal cache, wherein, in response to an evict microinstruction, all ways of the internal cache are disabled except for a victim way*

are taught, see col. 4, lines 17-62, and col. 5, lines 63, by Lyon which teaches a system and method for a cache design that does not unnecessarily access the cache's data array in the fulfillment of a cache read or write access request, thus not wasting power, col. 4, line 20, the microinstruction taught by Lyon being a write request, col. 5, line 43, in which only a single way of multiple ways of a data array is powered up, col. 4, line 61, and accessed to satisfy that memory access request, col. 5, lines 22-24, in which Lyon's memory write request, col. 5, line 43, inherently includes the type of write request that is a cache victim write request, since a victim write is a type of cache write request, and because the claimed disabling feature is functionally equivalent to Lyon's teaching that ways not necessary to the fulfillment of the victim write type write request are not powered-up and thus save power in the cache system because cache data arrays are not accessed unnecessarily, col. 5, line 31;

Claims 8 and 10,

the limitations,

b. *in response to a microinstruction, disabling predetermined modules within an internal cache,*

wherein, in response to a tag inquiry microinstruction, data fields of the internal cache are disabled

and

c. *in response to a microinstruction, disabling predetermined modules within an internal cache,*

wherein, in response to a tag write microinstruction, data fields of all cache entries are disabled

these are taught, see col. 3, lines 59-61, and col. 5, lines 6-10 and 63, by Lyon which teaches a system and method for a cache design that does not unnecessarily access the cache's data array in the fulfillment of a cache request that require access only to the cache's tags, thus not wasting power, col. 4, lines 19-24, the microinstruction taught by Lyon being a tag access request, see col. 4, lines 48-62, where data fields in the data arrays are not powered up to save power during tag access (requests) which inherently include both a tag inquiry or a tag write since a tag write or tag inquiry is an example of a tag access request and because the claimed disabling feature is functionally equivalent to Lyon's teaching that data arrays are not powered up unnecessarily, col. 4, line 60, and col. 5, line 60-63, and col. 9, lines 47-49;

Claims 9, 11, 13 and 14,

the limitations,

d. *in response to a microinstruction, disabling predetermined modules within an internal cache,*

wherein, in response to a tag and data read microinstruction, all ways are disabled except a target way

and

e. *in response to a microinstruction, disabling predetermined modules within an internal cache,*

wherein, in response to a tag write microinstruction, all ways are disabled except a target way

and

f. *in response to a microinstruction, disabling predetermined modules within an internal cache, wherein, in response to a tag write/data read microinstruction, all ways are disabled except a target way*

and

g. *in response to a microinstruction, disabling predetermined modules within an internal cache, wherein, in response to a tag and data write microinstruction, all ways are disabled except a target way*

these are all taught, col. 4, lines 53-60, for the instances where a tag access results in a hit for a data read or write inquiry, where the tag access performed is inherently a tag inquiry, for tag read, or for tag write, and where in claim 13 the "tag write/data read" is equivalent to "tag write" and "data read", and taught, col. 5, lines 12-27, as only one data array is powered up and accessed to service the data read or the data write, and because the claimed disabling feature is functionally equivalent to Lyon's teaching that data arrays are not powered up unnecessarily, col. 4, line 60, and col. 5, line 60-63, and col. 9, lines 47-49;

Claim 16,

the limitations,

h. *in response to a microinstruction, disabling predetermined modules within an internal cache, wherein, in response to a data write microinstruction, all ways are disabled except a target way*

are taught, see col. 5, lines 11-27, by Lyon as satisfying an access request that is a data write request in which only one data array in which data resides is powered up and accessed, col. 5, line 23, and because the claimed disabling feature is functionally equivalent to Lyon's teaching that other ways not necessary to the fulfillment of the access request are not powered-up and thus

save power in the cache system because cache data arrays are not accessed unnecessarily, col. 5, line 31.

Allowable Subject Matter

13. Claims 21-35 are objected-to as indicated above, however, contain subject matter which read over the prior art of record.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Elmore whose telephone number is (703) 308-6256. The examiner can normally be reached on Mon-Fri from 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on (703) 305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Elmore

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Art Unit 2186

April 25, 2004